

## New strategies to avoid bankruptcy

*Bankruptcy is a threat that most companies tend to ignore until it is too late. However, proper forecasting and subsequent planning can help fend off problems before they occur. And intellectual property has a key role to play.*  
By **Sam Khoury and Paul Malz**

Business seems good, so good it's hard to imagine otherwise. Optimistic business plans are materialising, the company has excellent creditor relations and capital is available at low rates. Venture capital is plentiful for technology funding and investors are focused more on growth than profits. Then over a few years, or perhaps even a few months, things change.

While more than 40% of business start-ups are destined for bankruptcy court, few companies anticipate it happening to them. They are often without quarterly financial assessments to forecast risk of bankruptcy, or a plan of aggressive tactics that might avoid a looming bankruptcy. And, if the unimaginable does happen, they are without systematic plans to manage their affairs during a liquidation or reorganisation.

Three steps can help reduce the risk of bankruptcy:

- First, begin with a formal plan to monitor the company's financial condition and economic environment.
- Second, perform an inventory and valuation of intellectual properties.
- Third, leverage these intangibles to provide cash flow insurance.

This plan to inventory and leverage intangible assets is similar, in a broad sense, to the more familiar responsibility of managing and exploiting tangible assets such as property, plant and equipment.

### **The least popular option**

Bankruptcy is perhaps one of the least popular options for a business to consider. The only firewall against catastrophic failure for many companies is the belief that it can't happen to them. But statistics show that it can and does

happen to many. Bankruptcy filings in the US posted a 9% jump in the first quarter of 2003, with 412,968 filings. Business and personal filings have both increased in response to the current economic stall.

The tendency to avoid the topic, however, means that bankruptcy usually isn't discussed until it's too late. Business plans fail to address what actions to take during the convergence of worst-case events, such as a market downturn, increased competition, crippling litigation or a drying-up of credit sources. And when a financial crisis does occur, there is no plan to overcome it. In this situation, the likelihood of failure moves quickly from possible...to probable...to inevitable.

### **Stakes are raised**

Federal bankruptcy law in the United States is defined primarily in Chapters 7, 11, and 13 of the US Bankruptcy Code. Businesses may file only under Chapters 7 and 11. Chapter 7 offers a complete discharge of all debts through the liquidation of a business. Chapter 11 allows a troubled business to work with its creditors to develop a recovery plan, without discharging all debts. Under Chapter 11, as it is currently written, a business has 120 days to prepare a reorganisation plan, with a proposal for repayment of some debt and the discharge of other debt. Creditors may attend the court hearing on the reorganisation plan, and the court has the authority to convert Chapter 11 reorganisation to Chapter 7 liquidation.

In response to widespread criticism of bankruptcy law, Congress created the National Bankruptcy Review Commission (NBRC). The NBRC offered recommendations for tougher guidelines for businesses seeking bankruptcy relief, especially those with unsecured debts

of US\$5 million or less. These companies would face Chapter 11 requirements that include increased reporting requirements, greater supervision by trustees and shorter deadlines for financial turnaround.

Of course, companies always have the option of out-of-court settlements with creditors. Tougher government bankruptcy scrutiny, however, will make these out-of-court compromises less appealing to creditors.

## Forecasting failure

A company's options narrow quickly as it approaches a financial crisis. Clearly, the first preventive measure is to monitor financial health on a quarterly or even monthly basis. There is a large body of research on predicting bankruptcy through financial analysis, using key ratios and cash flow data. When weighing the effectiveness and value of these forecasting tools, consider two types of error that may occur:

1. forecasting a bankruptcy when the company later proves to be solvent; or
2. classifying a company as solvent when it is later forced into bankruptcy.

The relative cost of each of these two types of errors needs to be considered. Type 1 errors have a finite cost. For example, a Type 1 error might prompt unnecessary actions, such as a company selling valuable assets or laying off staff. A company, however, would survive a Type 1 forecasting error.

Type 2 errors in forecasting are the most expensive, for both insolvent companies and

their creditors. Type 2 errors provide false security where timely action is truly needed. A false prediction of Type 2 could, quite obviously, lead to the liquidation of the company. An evaluation and comparison of forecasting models should therefore favour those that minimise Type 2 errors.

The earliest predictive bankruptcy models date back to the 1960s. In a 1966 study published by William Beaver in the *Journal of Accounting Research*, the financial ratios of a group of failed firms were compared to a control group of solvent firms. Twenty-nine financial ratios were examined, with the goals of identifying which ratios best predicted failure and how far in advance of failure such a prediction could occur.

As shown in exhibit A, Beaver's ratios can be classified as cash flow ratios, net income ratios, debt-to-total assets ratios, liquid assets-to-total assets ratios, liquid assets-to-current debt ratios and turnover ratios. Perhaps not surprisingly, one of the cash flow ratios was the single best forecaster of pending failure. Specifically, the ratio of cash flow to total debt was identified as the best predictor in Beaver's single ratio or univariate analysis.

Most subsequent work in bankruptcy prediction has focused on multivariate analysis, with forecasts based on a combination of ratios. Multivariate models have yielded fewer errors of both Type 1 and Type 2. Using statistical analysis, multivariate models are created by determining which sets of financial ratios best correlate with financial solvency, and the relative weight each financial ratio should be given.

## Exhibit A – Ratios used in Beaver's univariate study

<b>Group I (cash flow ratio)</b>	<b>Group V (liquid assets-to-current debt ratios)</b>
1. Cash flow to sales	1. Cash to current liabilities
2. Cash flow to total assets	2. Quick assets to current liabilities
3. Cash flow to net worth	3. Current ratio (current assets to current liabilities)
4. Cash flow to total debt	
<b>Group II (net income ratios)</b>	<b>Group VI (turnover ratios)</b>
1. Net income to sales	1. Cash to sales
2. Net income to total assets	2. Accounts receivable to sales
3. Net income to net worth	3. Inventory to sales
4. Net income to total debt	4. Quick assets to sales
<b>Group III (debt-to-total assets ratios)</b>	5. Current assets to sales
1. Current liabilities to total assets	6. Working capital to sales
2. Long-term liabilities to total assets	7. Net worth to sales
3. Current plus long-term liabilities to total assets	8. Total assets to sales
4. Current plus long-term debt plus preferred stock to total assets	9. Cash interval (Cash to fund expenditures for operations)
<b>Group IV (liquid assets-to-total assets ratios)</b>	10. Defensive interval (Defensive assets to fund expenditures for operations)
1. Cash to total assets	11. No-credit interval (defensive assets minus current liabilities to fund expenditures for operations)
2. Quick assets to total assets	
3. Current assets to total assets	
4. Working capital to total assets	

## The Z Factor

One of the most successful multivariate methods for predicting insolvency is Edward I. Altman's Z-score model, first presented in the *Journal of Finance* in 1968 and subsequently refined over several decades. The Z-score is a value yielded by the following discriminate analysis formula:

$$\begin{aligned} Z = & 1.2 \times (\text{working capital}/\text{total assets}) \\ & + 1.4 \times (\text{retained earnings}/\text{total assets}) \\ & + 3.3 \times (\text{earnings before interest and} \\ & \quad \text{taxes}/\text{total assets}) \\ & + 0.6 \times (\text{market value equity}/\text{book value} \\ & \quad \text{of debt}) \\ & + 1.0 \times (\text{sales}/\text{total assets}) \end{aligned}$$

The multipliers applied to the ratios reflect the quantitative importance of each ratio to overall financial solvency. These five key ratios, with their multipliers, provide a single predictive score. If the resulting Z-score is below 2.675, bankruptcy is forecasted. Z-scores above 2.675 forecast solvency. Altman and his associates later refined this original model, creating a model called ZETA. The parameters and calculations of the ZETA model are proprietary and have not been disclosed. The Type 1 and 2 classification errors of the original Z-score and the ZETA model are shown in exhibit B. Both the Z-score and ZETA models are useful predictors of bankruptcy.

Clearly, the cash flow generated by intangible assets can have a direct or indirect effect on all of a company's Z-score ratios. Trends in a company's Z-score, monitored on a quarterly basis when its earnings statement is updated, can thus be used to improve the resulting Z-score.

Exhibit C shows the trend in Z-scores for several well-known companies for 1999 through 2002. Over the last several years, the most severe Z-score change was for Time Warner, formally known as AOL Time Warner. In January 2001, American Online merged with Time Warner to form AOL Time Warner in a deal valued at over US\$106 billion. At that time, the merger brought promise of many synergistic opportunities. However, America Online was perceived to suffer from a lack of comprehensive broadband solutions, which in turn led to a slowdown in subscriber growth, a drop in average revenue per subscriber and a sequential quarterly decline in advertising revenues. A lower operating margin coupled with several asset write-downs caused the company's stock price to depreciate, resulting in a lower Z-score.

Tyco International also saw a decline in its Z-score, but for a different reason. Although some of the conglomerate's key businesses saw minor drops in profit margins during the

relevant period, the main factor was the lack of investor confidence. This was due to allegations of accounting irregularities and the forced resignation of the CEO in the first half of 2002. Even though a preliminary review of their accounting and governance practices did not uncover any fraud, but did find several incorrect accounting entries and aggressive accounting methods, the value of the company fell nearly 70% during 2002.

The Z-score of RJ Reynolds has been relatively stable through the recent economic turbulence. Cigarette demand being non-cyclical, profit margins have been very consistent. The major contributor to the smaller Z-score in 2002, compared to 2001, was a 20% decrease in company value, but this was less than the overall decline of the S&P 500 during the same time period.

Amazon experienced improving financial conditions from 1999 to 2002. The comeback began in the first quarter of 2001 when the company surprised the market with its first profitable quarter. From then, sales increased due to new product selections, price reductions and international segment expansion. At the same time, operating margins improved, aided by better inventory management, lower expense ratios and higher productivity. The company's financial turnaround was directly reflected in its equity market value, which increased by approximately 75% in 2002. If the figures are examined, it is probable that Amazon's Z-score increased in 2003, as the company's operating margins continued to improve and its value was up 200% through to October of that year.

When considering the Z-score model, recall that bankruptcy is a legal rather than a financial event. A trend toward insolvency, identified in a timely manner by the Z-score, can make all the difference. Companies can forestall bankruptcy by renegotiating credit terms, restructuring debt or selling assets to raise cash. One of the least considered, yet most effective means of raising cash is through the intellectual properties of a business.

## Cash is king

During a financial crisis, cash is king. A distressed company will often turn to property, plant and equipment (PP&E) as sources of cash through a quick sale. Personnel cuts may also boost earnings. Intangible assets in the form of intellectual properties, such as trademarks, corporate know-how, patents, trade secrets and royalties, are often overlooked. But through leasing, sale, securitisation or monetisation, intangibles offer the safety of extra revenue during a business downturn. They represent an asset that is too often poorly understood and under-exploited.

## Exhibit B - Classification errors in Altman's two models

Years prior to bankruptcy	Original Z Model Classification Errors		ZETA Model Classification Errors	
	Bankrupt type (I)	Non-bankrupt type (II)	Bankrupt type (I)	Non-bankrupt type (II)
1	6%	3%	4%	10%
2	18%	6%	15%	7%
3	52%	NA	23%	9%
4	71%	NA	32%	10%
5	64%	NA	30%	16%

Companies apply less than 20% of the technologies created by their R&D departments to the commercial market. So, over 80% of patented technologies have no real business plan or imputed value. Likewise, saleable but ageing technology with a limited shelf life may be overlooked as a source of cash. Or a company may simply be unaware of how to market corporate know-how to non-competitors.

With or without the prompting of a financial crisis, a formal, rigorous inventory of intangible assets can help identify which properties should be retained and invested in or, alternatively, divested. Several questions should be asked and answered:

- Does the intangible asset have value to the business?
- Does it have value to another business?
- Is its value to another business greater than for the primary business?
- What are the direct and indirect costs or benefits of a sale?

### Methods of valuation

A valuation of intellectual properties can be based on cost, income or market information. The cost approach has the most limited applicability, since the value of an intangible property is rarely related to its cost of development. Under the cost method, the value of penicillin might be estimated as the cost of the wasted culture dish that was contaminated at London's St. Mary's Hospital in 1928 when Alexander Fleming made his discovery.

The market approach can be considered a valuation by proxy. This approach considers technologies that are identical or similar to the asset being valued. The difficulty of this approach is in finding an identical or similar technology, because none may exist. Assuming a similar technology does exist, the second hurdle is gathering financial details. Often this consists of corporate data that is private and unobtainable.

The most widely used valuation approach is the income method, which applies a discount factor to the future anticipated revenues from

a product. This discount factor includes global economic risk, country risk, company risk and /or technology risk. In bankruptcy, usually the technology worked and products are being produced; however, the company can no longer finance its debt or pay its creditors. This unfortunate event will yield discount rates higher than the usual 15% to 30%, but should not be so high that the technology is penalised. So, we see discount rates that range from 50% to 75%, because management did not know how to manage the business. The same technology in the hands of a well-managed team could be a very profitable enterprise to the extent that the technology could be discounted at the weighted average cost of capital, which is usually in the range of 10% to 15%.

The most accurate valuation methods, however, combine the market and income methods, and minimise their weaknesses by drawing on both market and income data. One hybrid approach, the Technology Factor method of valuation, places market and income data in context, through a consensus of experts both inside and outside the company.

### Protect intellectual property

Legal firewalls can be built in advance to protect intellectual properties in the event of a bankruptcy filing. In a Chapter 11 reorganisation filing in the US, for example, the current royalty stream is assigned to pay creditors. Any agreements in place to transfer or jointly develop intellectual properties are treated as executory contracts. However, the trustee is in control of these licensing agreements and may not allow them to be terminated and returned to the licensor. A Chapter 11 filing can be damaging, if not lethal, to the licensing process or any joint development agreements.

In Chapter 7 liquidation, the current royalty stream is likewise designated to pay creditors. Licensing executives are under tremendous pressure to generate immediate revenue through the liquidation of intangibles as distressed properties. Creditors are often

unwilling or unable to appreciate the value of these properties. They may be distributed to creditors in lieu of cash and subsequently waste away on the shelf.

To protect intellectual properties during Chapter 7 or 11 bankruptcies, intangible assets should be separated from tangible assets, and a separate holding company created for them. Licence agreements should also be drafted in a manner that protects both licensee and licensor in the event of a bankruptcy.

On the buyer's side of the table, a business can benefit from companies that lack this foresight. Bankruptcies of competitors and even of non-competitors are opportunities to gain both tangible and intangible assets at steep discounts. Several websites serve as clearing houses for this information. To identify auctions for trademarks, websites and royalties, visit [www.bankruptcsales.com](http://www.bankruptcsales.com). To obtain daily listings of companies that have filed for bankruptcy, go to [www.bankruptcydata.com](http://www.bankruptcydata.com). For general information about trends in bankruptcy, the American Bankruptcy Institute also maintains a site at [www.abiworld.org](http://www.abiworld.org).

### Every business is at risk

Failing businesses in the US cost over US\$23 billion annually, and 70% of business bankruptcies end in liquidation. No company is immune from this risk. Effective management of intellectual assets can allow a company to prevent or at least weather a bankruptcy, without giving away the keys to the kingdom. This expertise can also help a business acquire and exploit the intellectual assets of competitors, if they're obliged to part with them during a financial crisis.

Our preferred method of portfolio management involves the evaluation of the full array of a company's intellectual properties, bringing product and market data together on each respective technology. These intellectual assets are then screened to determine which potential projects should be thoroughly valued. In order to obtain a project's true intrinsic value, Real Option

analysis should be incorporated.

Real Option analysis is an enhancement over the income approach and Technology Factor method, as these static models assume management cannot respond to unanticipated business conditions. In reality, however, throughout a project's duration a manager possesses real options - the ability to defer additional work, abandon it outright, shut it down and restart later, expand it, trim it back, continue investing capital or even switch its strategic purpose. This flexibility adds value to the project, which in turn will increase company value since the number of rejected valuable projects can be minimised.

Since most future cash flow values are estimated based on most probable outcome, there is a high degree of uncertainty in the valuation. Monte Carlo spreadsheet simulation addresses this uncertainty by sampling multiple variables with the purpose of generating numerous forecast scenarios. This enables a manager to quantify, with certainty, a project's ability to attain various financial benchmarks, such as expanded net present value, return on investment, internal rate of return and payback period.

In financial theory, all projects with a positive expanded net present value should be pursued. In reality, companies face capital restraints especially if they are facing financial difficulties. With every capital budgeting decision being crucial to the wellbeing of the company, senior executives should accurately prioritise and optimise its portfolio of businesses. Portfolio optimisation is a process through which the objective of a portfolio of individual projects is maximised/minimised given constraints. This detailed portfolio management process maximises business value by implementing a most favourable placement strategy for each technology, whether in internal commercialisation, by a business unit, joint venture, licensing, donation or other areas.

### The securitisation option

Struggling companies that are in desperate need of cash flow can also address their

### Exhibit C - Trends in Z-scores from example companies

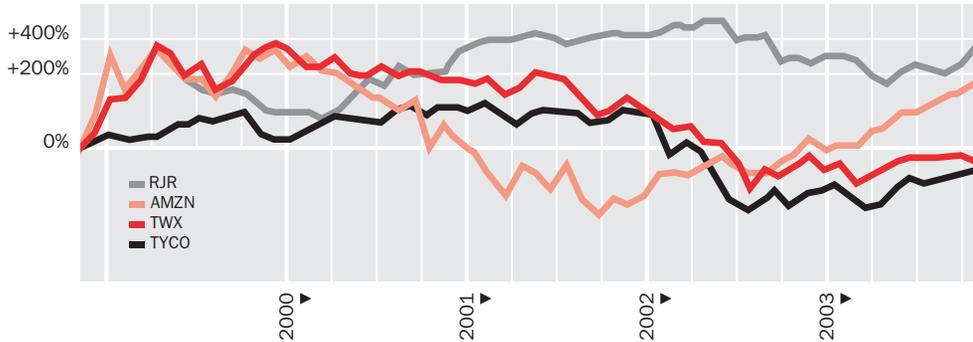
Company	1999 Z-Score	2000 Z-Score	2001 Z-Score	2002 Z-Score
AOL Time Warner	188.20	35.35	3.94	0.56
Amazon.com	12.59	2.31	3.09	4.23
R J Reynolds	0.89	1.14	2.85	1.25
Tyco	5.29	5.66	3.80	1.54

Healthy non-bankrupt: > 2.675 / Bankrupt: < 2.675

Source: AOL Investment Research

## Exhibit D – Five-year stock price chart from example companies

Tyco International Ltd as of 5th November 2003



Source: Yahoo Finance

financial needs by securitising their intellectual assets. IP securitisation involves converting intellectual assets into marketable securities that can be sold or used as collateral in obtaining a loan. While maintaining the use of the intellectual asset, businesses can immediately receive cash at a lower cost of capital, which would improve their financial ratios.

An example of a company utilising IP securitisation was reported in the October 2003 issue of *Licensing Economics Review*. Fashion retailer Guess? reported a net loss of US\$11.2 million for the six months ended 28th June 2003. Guess? Royalty Finance LLC, an indirect wholly owned subsidiary of the company, recently issued a private placement of asset-backed notes secured by rights and interests in specific licence agreements of specified Guess? trademarks and monies payable or becoming payable. The notes will be secured by the royalties generated under such specified licence agreements (and any replacement licence agreements or additional licence agreements specified later), and will have the benefit of a guarantee issued by Guess? IP Holder LP, another indirectly wholly owned subsidiary of the company.

Intellectual assets are becoming better understood and are being used in unprecedented ways to boost earnings. Consumer products giant Procter & Gamble, faced with the costs of corporate restructuring and with turmoil in some of its overseas markets, is generating additional revenue by offering its famed marketing methodologies to non-competitors, including Coca-Cola. Through a joint venture with Worldwide Magnifi, a global provider of marketing infrastructure applications, P&G's experts are offering marketing know-how, analytical methodologies and patented software. Target customers are 2,000 global marketers, served by a new

company with stock held by P&G and Worldwide Magnifi.

As stated by P&G Global Marketing Officer Bob Wehling: "Creating this new company...is consistent with P&G's interest in developing new business models and its desire to get greater financial value out of core assets like R&D, inventions and marketing know-how." What is the lesson here? Companies don't need to face bankruptcy in order to cash in. ■

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